

## Devoted to the 120<sup>th</sup> Birth and to the 75<sup>th</sup> Death Anniversaries



*Kocherga N.K., PhD, Associate Professor  
Perederiy I.H., DSc, Professor  
Poltava National Technical Yuriy Kondratyuk University*

### **YURIY KONDRATYUK (OLEXANDR SHARGEY): KNOWN AND UNKNOWN**

At the beginning of the 21 century it became clear that the «heavenly» cosmic philosophy of Tsiolkovsky and so called the «planetary» cosmic presented by F.A. Tsander are both to some extent premature, and the «earth» or «ground» cosmic philosophy of Yu.V. Kondratyuk is the most urgent for the Earth because it could realize some peaceful space programs for the benefit of mankind. «The whole universe space is developing not in accordance with Tsiolkovsky's or Tsander's theories but with that of Kondratyuk», said B.I. Romanenko, the scientist, who has been studying the interplanetary space for many years and who was Yuriy Kondratyuk's colleague and biographer. In the history of national science it is difficult to find more dramatic fortune than the life and career of the outstanding self-taught scholar from Poltava.

One of the cosmism pioneers and space era forerunners, Olexandr Ignatovych Shargey, lived and worked for many years under another name: Yuriy Vasyliovych Kondratyuk. During the Civil War in Russian Empire he had to take someone's name though he did not commit any crime against people or country, and he had never taken his real name back, as it was the period of Stalin's repressions.

The name of Yuriy Kondratyuk had only gained the worldwide recognition in the period of American Moon exploration. On March, 31, 1969, American magazine «Life» published the article by John Hubolt, the NASA research center employee. He wrote: «When I was watching the Apollo-11 launch and the first manned flight to the Moon, I recalled the engineer, whose dream had been broken by people's skepticism». Hubolt wrote about the Ukrainian self-taught engineer Yuriy Kondratyuk, who had calculated the LOR scheme 50 years before and it became the best one for reaching the Moon's surface [1].

Soviet people had known nothing about Yu.V. Kondratyuk's outstanding contribution to the space exploration development till the end of the 70s, when his name returned from oblivion... [2]. Not knowing about the ideas of Tsiolkovsky and other founders of the space flights theory, he answered the questions already solved by them, but he was often doing it in his own way, thus confirming their results. However, he went further, particularly in the problems of developing the economizing means of launching spacecraft from the Earth's surface, original rocket engine and interplanetary spacecraft design. He tried to achieve reliable control and stability of a space flight. In his Petrograd manuscript Shargey went on developing the idea of solar power usage which he had started in Poltava. He offered to utilize thin-walled reflectors of various shapes, as means for installation near a spacecraft together with concentrated solar heat receivers connected with water tubes. According to Shargey, water in heated receivers is to be split into oxygen and hydrogen, i.e. fuel, (oxidizer and fuel) for the rocket engine. He had designed reflector structure and estimated the sunlight intensity.

By the autumn of 1919 he had finished the second manuscript, which was called «To Those Who Will Read for the Purpose of Building». This was his most multi-aspect work dated with 1918-1919. The manuscript was prepared for publication, but it was first published only in 1964 in the book «Pioneers of Rocket Techniques»: Kibalchich, Tsyolkovsky, Tsander, Kondratyuk. Selected Works. («Science», Moscow) [3].

In this work Shargey further developed economizing methods of launching a «shell» from the Earth; he made his suggestions concerning flights stabilization with the help of gyroscopes; shell control; multi-usage of solar energy with the help of light, reflectors which can be mounted in the space both for the interplanetary spacecraft's purposes and for «earth» recycling. Here the author expresses the idea of using reflectors for «wireless telegraphy», i.e. the idea is forecasting placement of beam reception and radiation antennas. The design issues of the «shell» and its engine get their further development; an airlock is offered to contact with the open space, and it is recommended, that one should get out of the shell's chamber in the suit, more or less identical to diving suits, having some air reserve» i.e. the idea of a space suit is expressed. The safest crew location in the «shell» at departure is suggested (when heavy acceleration is taking place) depending on the movement direction: their location in separate «forms» – lodgments (cradles) perpendicularly to the movement direction. Complications, which occur when flying at high speed through the atmosphere, are considered; and the ways of avoiding «shell» overheating and using atmosphere for the «aerodynamic descent» are indicated.

In his «Theory of Flight» Olexandr Shargey brilliantly predicted stages of space exploration both for the present day and for the future. The most important of them was the flight scheme from Earth to the solar system planets, suggested by the scientist, using small take-off and landing module, that scheme is now called the «snail route of Kondratyuk», which has been successfully mastered by earthmen.

The young scientist was far ahead of foreign scholars of that time, working in the field of rockets and interplanetary flights. He had made a new step in rocket science and technology development. This research was carried out after the first works of Tsiolkovsky, but not overlapping them and made independently of them, and finally confirmed the complete priority of Russian science and engineering in the space branch.

The deep content of these manuscripts and the original study method, used in them, have presented us with the undisputed fact, that we are dealing with historical documents that should be forever inscribed into the glorious chronicles of science.

In January, 1929, Yu.V. Kondratyuk published (on his own money) the main book of his life, which was to reach the grateful descendants, «The Interplanetary Space Conquest» [4] edited with a run of 2000 copies, where he had presented the study of interplanetary flights in the best way, comparing to all available at the time of native and foreign literature. Professor Vietchinkin said in his review that those papers contained a number of new issues of paramount importance which other authors did not even mention about. They include:

1. Suggestion to take advantage of different substances burning in ozone, but not in oxygen, which raises the combustion temperature;

2. Suggestion to use solid fuel (lithium, boron, aluminum, magnesium, silicon) in addition to gases, both to raise the combustion temperature and to burn tanks after emptying them from the liquid fuel process themselves and placing into the oven;

3. Kondratyuk was the first to give the formula considering that fuel and oxygen cells weight effects the total rocket weight, and proved that the rocket that does not reset and burn its cells on the move, can not overcome the Earth's gravity;

4. Yu. V. Kondratyuk not only pointed out the necessity of applying wings on the rocket, but he had also performed detailed study of the conditions under which the wings would be useful, what would be in that case the oblique angles of the rocket's trajectory towards the horizon, and indicated the best rocket reaction force at flying in the air; it appeared to be equal to the initial rocket weight [5].

In June, 1930, as a result false denunciation, Kondratyuk together with Horchakov and other co-workers were arrested, accused of wrecking and sentenced to three years of labor camps, and later he was exiled to the place of mining equipment plant construction near Novosibirsk, where he was working until August, 1932, having managed to get a patent and a copyright certificate in the field of mining equipment.

Judicial Division for Criminal Cases at the Supreme Council of RSFSR, by its decision number CB-70-8 on March, 26, 1970, rehabilitated Kondratyuk for absence of crime in the act. In 1932 Yu.V. Kondratyuk moved to Moscow for working in the wind energy field. By this time he had already possessed nine patents and copyright certificates for his inventions.

On the 5th of July, 1941, Yu. V. Kondratyuk joined Moscow people's emergency volunteer corps. Private telephone operator Yuriy Kondratyuk participated in the combat actions in the area of Kaluga, Smolensk region, defended Kaluga, the hometown of Tsiolkovsky, Maloyaroslavets, fought near Tula. In the early of December, 1941, Yu. V. Kondratyuk was the communication officer of the 1st Squadron, belonging to the 49th Army of the Western Front. During the unsuccessful offensive at Bolkhov, while seizing springboard on the west bank of the Oka river, near the village of Krivtsovo, in the interval between 23 and 25, February, 1942, Yuri Kondratyuk died, providing communication among the eastern bank and the springboard.

The decision of the International Astronomical Union was to name a crater on the dark side of the Moon in honour of Yuriy Kondratyuk. One of the minor planets, asteroid under the number 3084, opened by M.S. Chernykh, a Crimean astronomer, is also named in his honour. The International Academy of Astronautics recommended to inscribe the name of Yu.V. Kondratyuk into the list of 78 world scientists, submitted for inclusion in the International Space Glory Hall [6].

The name of Yuriy Kondratyuk (Olexandr Shargey) is included in the Memory Book of Ukraine.

By the decision of the Ukrainian Government, on June, 21, 1997, on the occasion of the 100th anniversary of the prominent space theorist, brilliant engineer - inventor and innovator, his name was granted to Poltava State Technical University, whose scientists were developing their research projects on improving the construction durability and reliability, thus implementing the ideas of Yuriy Kondratyuk (Olexandr Shargey) into reality. These lines taken from the University Anthem vividly express the place and role of Yuriy Kondratyuk in the students life:

Kondratyuk, the glorious, has given you his name.

We're proud to belong to that family of fame.

The best-loved University, we'll keep in our hearts

Spirit of the sciences, spirit of the arts!

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